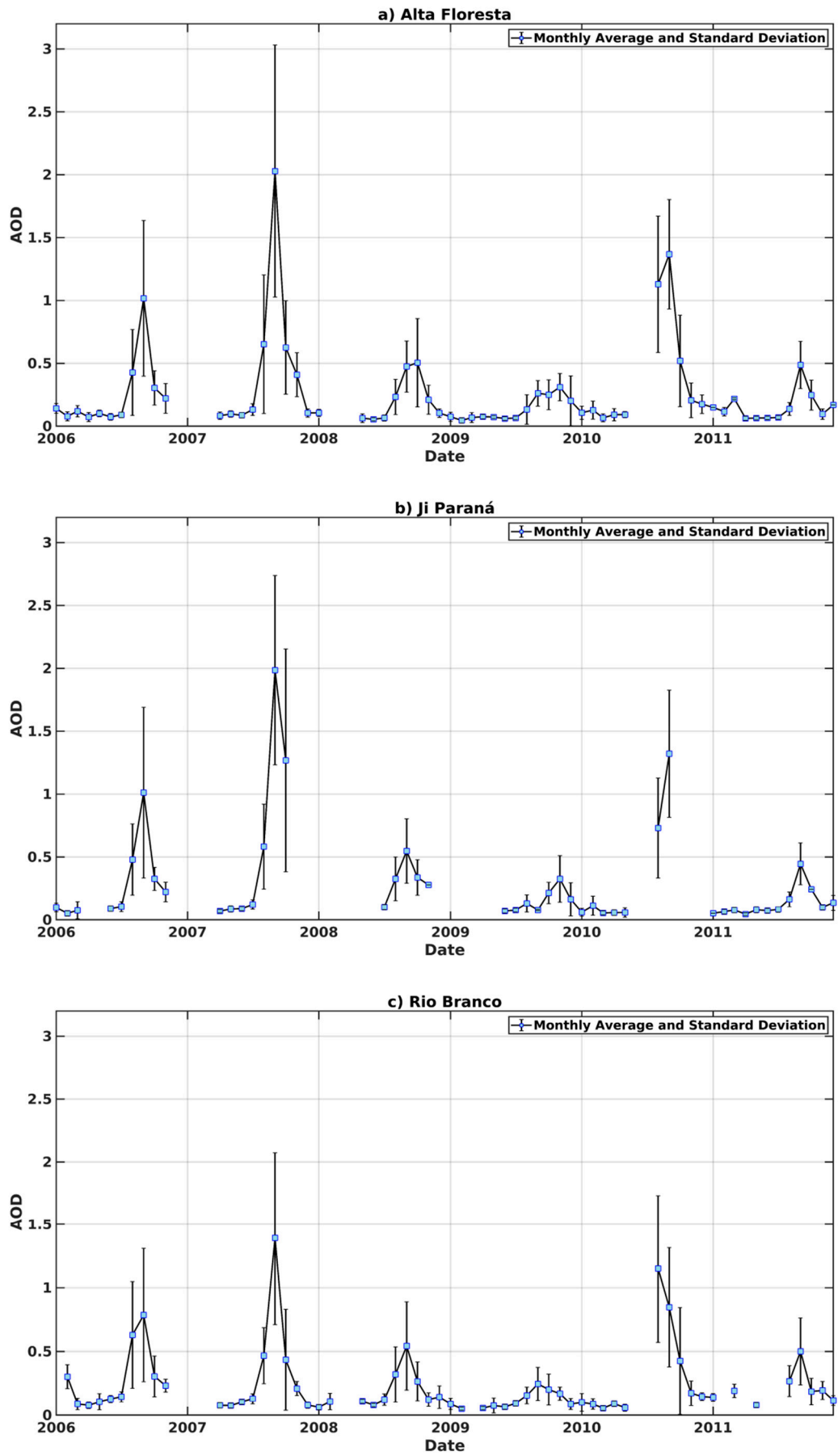
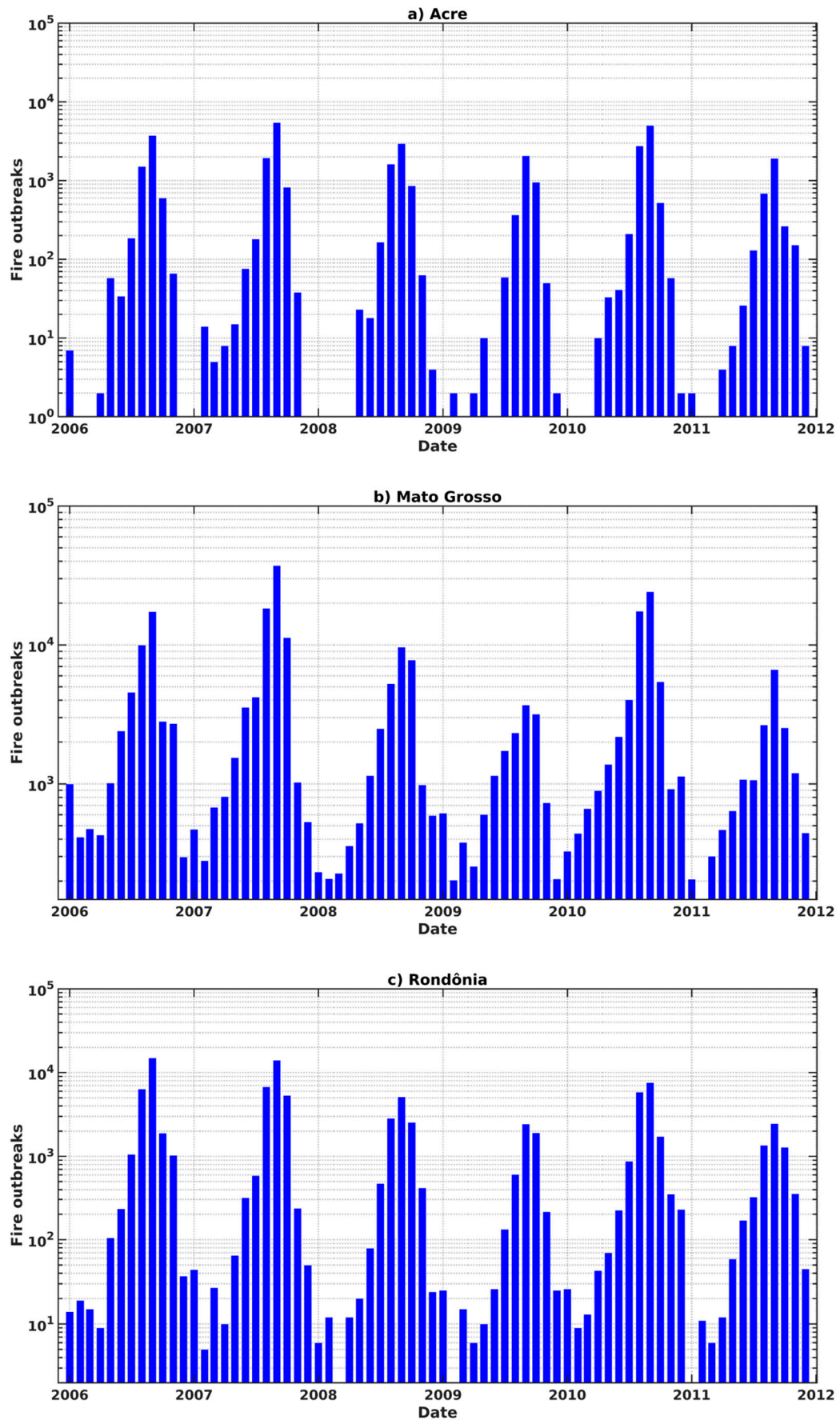


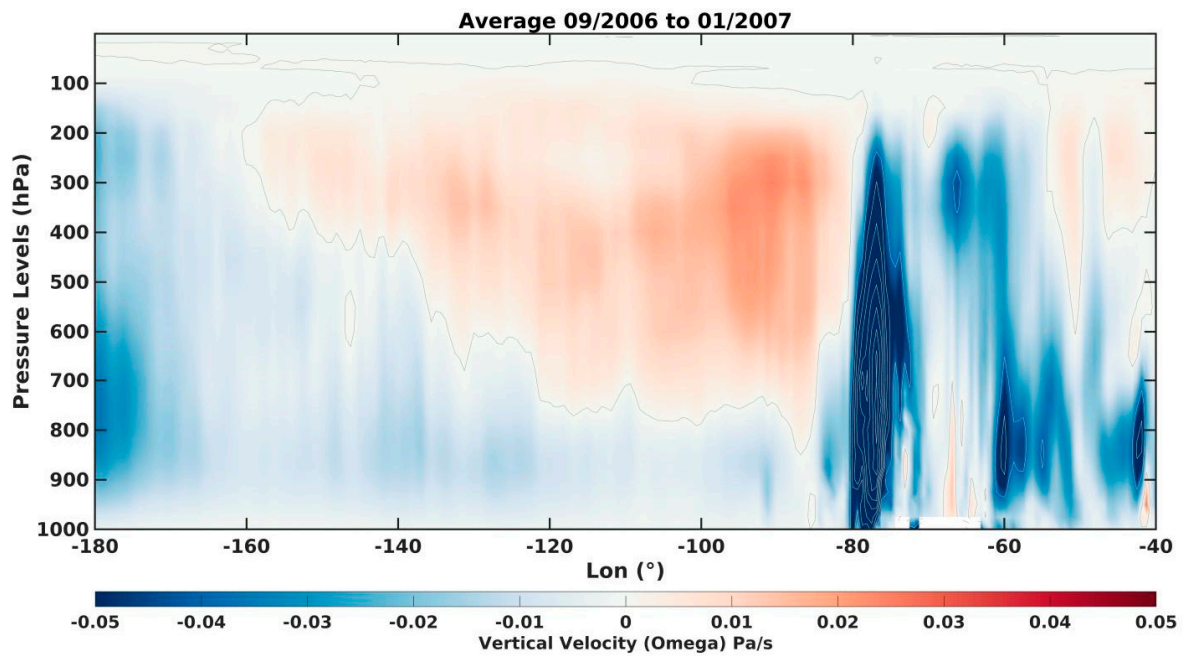
# SPPLEMENTARY MATERIAL



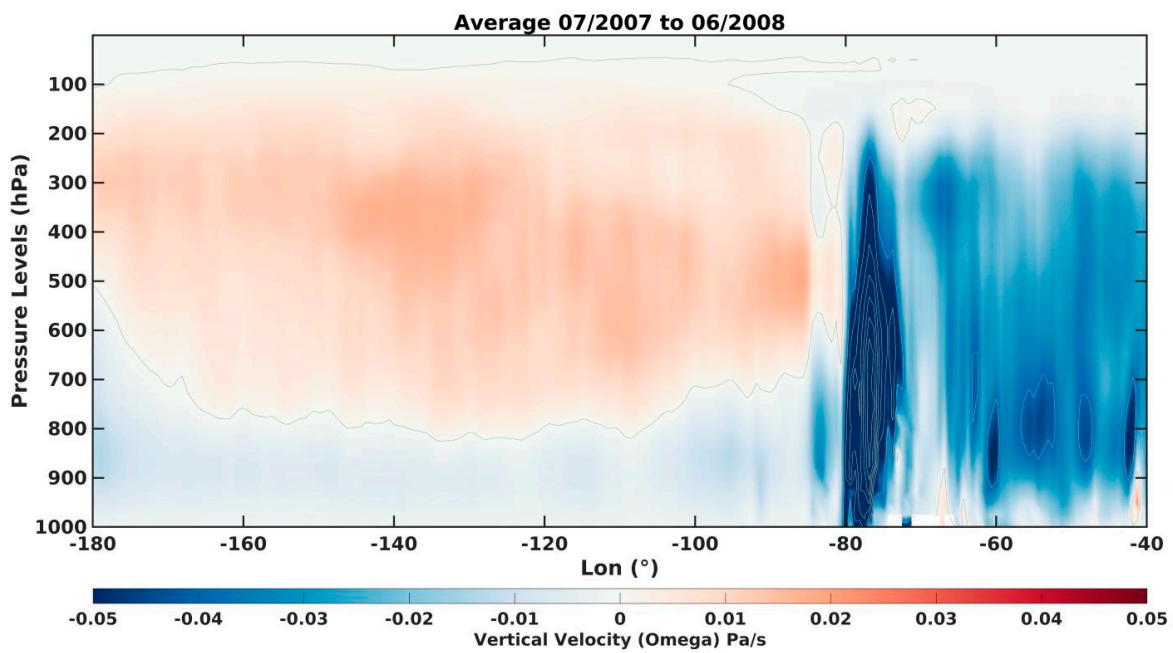
**Figure S1.** Time series of aerosol optical depth (AOD) at 550 nm from AERONET with monthly average and monthly standard deviation for the sites of **(a)** Alta Floresta, **(b)** Ji Paraná, and **(c)** Rio Branco sites.



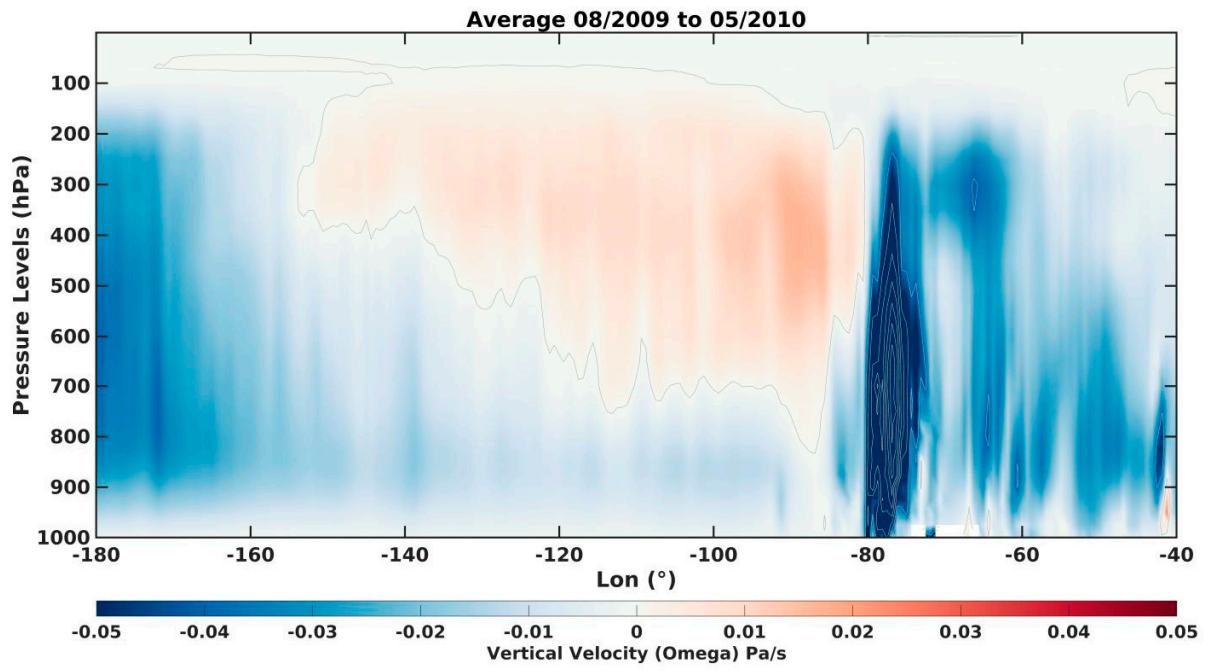
**Figure S2.** Time series with the monthly accumulated fire outbreaks for the states where the AERONET sites are located. **(a)** Acre, where the Rio Branco site is located; **(b)** Mato Grosso, where the Alta Floresta site is located; and **(c)** Rondônia, where the Ji Paraná site is located. The y-axis of the graph is displayed on a logarithmic scale. Fire outbreak data derived from the National Institute for Space Research (INPE), available at: <http://terrabrasilis.dpi.inpe.br/queimadas/bdqueimadas/#exportar-dados>.



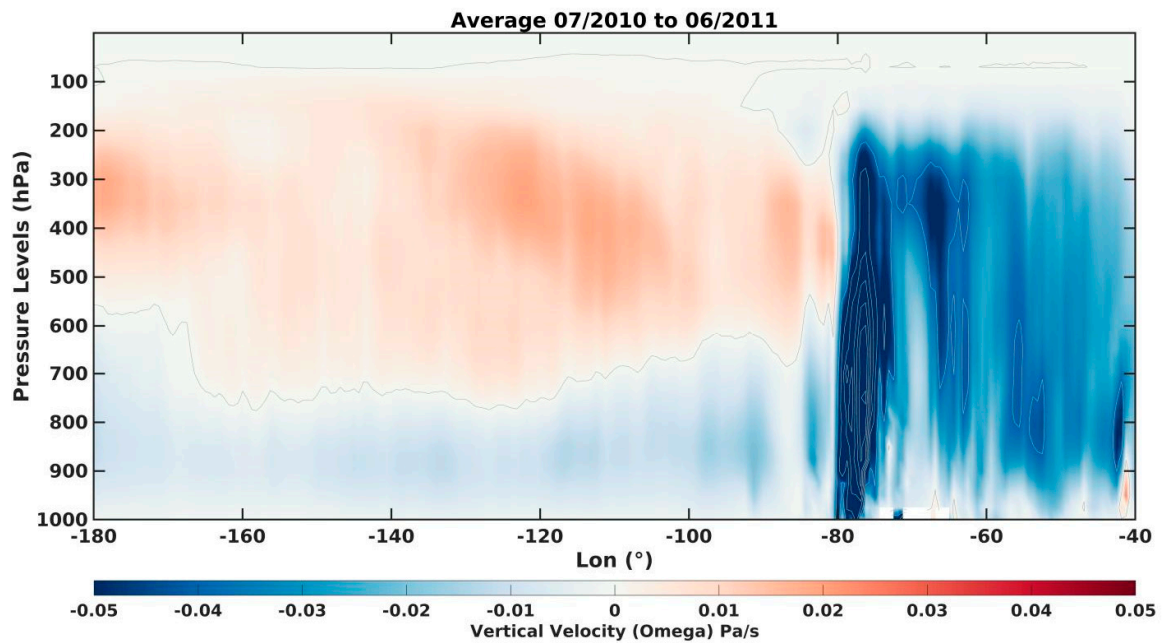
**Figure S2.** Cross-section between longitude and pressure levels (hPa) within the longitude range of  $10^\circ$  and  $-10^\circ$  for the average vertical velocity ( $\omega$ ) in Pa/s between the period from 09/2006 to 01/2007, covering the EN-0607 period.



**Figure S4.** Cross-section between longitude and pressure levels (hPa) within the longitude range of  $10^\circ$  and  $-10^\circ$  for the average vertical velocity ( $\omega$ ) in Pa/s between the period from 07/2007 to 06/2008, covering the LN-0708 period.



**Figure S3.** Cross-section between longitude and pressure levels (hPa) within the longitude range of  $10^\circ$  and  $-10^\circ$  for the average vertical velocity ( $\omega$ ) in Pa/s between the period from 08/2009 to 05/2010, covering the EN-0910 period.



**Figure S4.** Cross-section between longitude and pressure levels (hPa) within the longitude range of  $10^\circ$  and  $-10^\circ$  for the average vertical velocity ( $\omega$ ) in Pa/s between the period from 07/2010 to 06/2011, covering the LN-1011 period.